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10/812,368	03/29/2004	Shaun Kazuo Wakumoto	200100254-1	5245
22879 7590 04/17/2009 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400				
EXAMINER				
WONG, WARNER				
ART UNIT		PAPER NUMBER		
2416				
NOTIFICATION DATE		DELIVERY MODE		
04/17/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/812,368

**Applicant(s)**

WAKUMOTO ET AL.

**Examiner**

WARNER WONG

**Art Unit**

2416

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26 and 27 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-4, 7-20 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soloway (US 2003/0165137) in view of Chiu (US 2002/0186658) and Dantu (US 7, 167,443).

**Regarding claims 1, 12 & 16,** Soloway describes a method in a packet switch apparatus within a switching mesh of handling oversubscribed ports between switches (abstract, move data flows from congested links to lightly load links), comprising:

a plurality of ports (fig. 2 & para. 11, switch comprising plurality of ports 130-140);

a switch controller coupled to a plurality of ports (fig. 2, switch processor);

wherein the switch uses procedure in memory (fig. 2, memory) for:

detecting an oversubscribed port at a detecting switch (fig. 4 para. 40, each of the possible congested links 330-370 corresponds to a GL port 110);

selecting a set of paths exiting at the oversubscribed port for retagging (para. 40-42, determining for each data flow (set of paths) which goes to the congested link with corresponding port (oversubscribed port) to change its routing (retagging));

rerouting the received packets with a tag associated with a detour path (para. 34 & 40, determining a exit port corresponding to non-congested link).

Soloway describes adjusting the routing tables to move data flows (para. 40), but fails to describe:

- invalidating tags for the set of paths;

- receiving packets with the invalidated tags;

Chiu describes a method of handling congestion using MPLS, suggesting:

invalidating tags for the set of paths, and receiving packets with the invalidated tags (para. 25 & 29, routes are setup such that upon detecting primary LSPs labels (invalid tags) in a receiving packet, it will be re-labeled (re-tagged) with an alternate LSP label for the alternate path).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to describe the invalidating of tags and receiving packets with invalidated tags as described by Chiu for the switching network of Soloway.

The motivation for combining the teachings is that by using MPLS for the selective traffic offloading, traffic is rapidly redistributed for better link utilization (Chiu, para. 6)

Soloway and Chiu combined fail to explicitly describe: retagging the received packets.

Dantu describes a congested based rerouting using protection (another) path (col. 10, lines 61-63 in view of col. 9, lines 50-55), comprising: retagging the received packets (col. 21, lines 1-10, relabeling (retagging) packets when traffic is congested).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to specify retagging of received packets as in Dantu for the congestion-based rerouting of Soloway and Chiu combined.

The motivation for combining the teachings is that it yields a reliable a quick way to transport user traffic to and from the internet (Dantu, col. 4, lines 37-39).

**Regarding claims 2 and 13,** Soloway further describes:

determining the detour path from the detecting switch to a destination switch for the set of paths (fig. 1 or 4, determining non-congested link (detour path) from switch 0 (detecting switch) to switch 2 (destination switch)).

**Regarding claims 3 and 14,** Soloway further describes:

comprising informing an owner switch of the set of paths that the paths are to be retagged by the detecting switch (fig. 4, switch 300 (owner switch) determines (is informed) the flows (paths) to be retagged).

**Regarding claim 4,** Soloway further describes:

more than one owner switch is so informed (para. 45 & 48, FSPF protocol which is being used for congestion detection by the network switches informs both ends of a switch pair (more than one owner switch), see fig. 4, switch pair 300 & 310).

**Regarding claim 7,** Soloway further describes:

the detecting switch is different from an owner switch of the set of paths (fig. 4, switch 300 (detecting switch) is different from switch 310 (owner switch) in the set of links 330-370 (paths)).

**Regarding claim 8,** Soloway further describes:

the detecting switch comprises a same switch as an owner switch of the set of paths (fig. 4, switch 300 (detecting switch) is also the owner switch)).

**Regarding claim 9**, Soloway further describes: wherein the set of paths includes at least one path (fig. 4, links 330-370 (paths)).

**Regarding claim 10**, Soloway describes: the switches are part of a switching mesh (the switching network 10 can be of a mesh topology of fig. 6c).

**Regarding claims 11 and 15**, Soloway describes: a tag for a path comprises an owner switch identifier, a destination switch identifier, and a path identifier (para. 27, the standardized fibre channel frame header format comprising a S\_ID (owner switch ID) and a D\_ID (destination switch ID – see Rickard, US 5,588,000 fig. 1 & col. 1, lines 27-30, herein cited but not used as a reference for the format of a fiber channel frame's with header fields in detail).

Soloway fails to describe that the tag comprises a path identifier.

Chiu describes the incorporation of MPLS protocol scheme comprising a label for each frame (path identifier).

**Regarding claim 17**, Soloway and Chiu combined further suggest:

a switch detecting an oversubscribed port is configured to determine a number of path tags associated with the oversubscribed port and to operate in at least two modes depending on the number of associated path tags (para. 45 & 57, load balancing of a congested link connected to a corresponding port equates to determining the number of flows connected to such congested link, each flow has its identifier (path tag). The number of flows decides one of many different allocations to load balancing (modes)).

**Regarding claim 18**, Soloway and Chiu combined further suggest:

if the number of associated path tags is larger than a threshold, then a first mode is used where some of the associated path tags are retagged by the detecting switch to a detour path tag, and the owner switch of those retagged paths are informed that those paths are no longer being used (Soloway, para. 50, if loading (i.e. number of flows each comprising tags) is greater than first threshold, then the (owner) switch instructs (informs) itself to perform load balancing (first mode), retagging flows with their corresponding new links/paths);

**Regarding claim 19**, Soloway and Chiu combined further suggest:

if the number of associated path tags is smaller than a threshold, then a second mode is used without retagging by the detecting switch (Soloway, para. 50, no load-balancing (second mode) is performed if number of flows to a particular link consisting a port < first congestion threshold).

**Regarding claim 20**, Soloway and Chiu combined further suggest:

in the second mode, a set of at least one path tag is chosen, and the owner switch of the chosen tags is (are) informed of the oversubscribed port (Soloway, para. 50, when congestion < first congestion threshold, yielding no load-balancing (second mode), the switch instructs (informs) itself to use the `xmt_port` for the original forwarding link (one path tag)).

**Regarding claim 22**, Soloway, Chiu and Dantu combined suggest:

the congested links from the switch (paths of the selected set of paths) and the detour path (Soloway, fig. 1, the rerouted exit lightly load link) individually comprise a

path between an originating source switch and an end destination switch the packets and includes a plurality of different switches intermediate of the source and destination switches (Soloway, para. 23, fabric 10 containing a plurality of switches in between).

**Regarding claim 23**, Soloway already described an original set of selected set of paths. Soloway, Chiu and Dantu combined further describe:

the detour path defines an order of the switches of the detour path to communicate the packets after the retagging and which is different than orders of the switches of respective ones of the selected path to communicate the packets (Dantu, col. 21, lines 5-10, the relabeling process to protection (detour) path defines a new set of switches used for routing (an order of switches of the detour path) which is different from set of switches used for routing in the working path (orders of the switches of respective ones of selected path).

**Regarding claim 24**, Soloway, Chiu and Dantu combined further suggest:

the invalidated tags and the tags associated with the detour comprise paths assigned to respective ones of the packets and which paths individually comprise a path between an originating source switch and an end destination switch of the packets and which includes a plurality of different switches intermediate between the source and destination switches (col. 21, lines 5-10, labels to congested working path replaced by labels to protection path (invalidated tags and the tags associated with the detour) for the packets, where each of working & protection path from originating to destination switch node includes a plurality of intermediate nodes (fig. 1)).

**Regarding claim 26**, Soloway, Chiu and Dantu combined further suggest:



the tags associated with the detour remain associated with the received packets after retagging and during subsequent communications of the received packets to an end destination switch by plural switches of the detour path (Dantu, col. 13, lines 30-40, replacement tags (tags associated with the detour) in MPLS forwarding table remains in table, hence remains associated to the received packets after retagging throughout plural switch in the protection (detour) path to the destination switch (col. 21, lines 5-10)).

**Regarding claim 27**, Soloway further suggest:

other packets, received by the packet switch apparatus during the rerouting of the received packets associated with the lightly-loaded (detour) path, are not rerouted by the switch controller (para. 41, routing and re-routing decisions are made on a flow-by-flow basis (other packets may not be re-routed as with the received packets)).

Soloway, Chiu and Dantu combined further suggest: tags of other packets and the retagging of packets (col. 13, lines 35-38).

2. Claims 5-6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soloway in view of Chiu and Dantu as applied to claims 3 and 20 above, and further in view of Vasseur (US 2005/0117512).

**Regarding claim 5**, Soloway describes moving at least some flows associated with the set of links between switches (para. 40), but fails to explicitly describe that the data flows having MAC addresses.

Vasseur describes: congestion rerouting where data traffic are of Ethernet (i.e. comprising MAC addresses) (para. 45 & 47)).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to describe congestion rerouting of data traffic with MAC addresses as in Vasseur for the combined teachings of Soloway and Chiu.

The motivation for combining the teachings is that it provides a further economy in signaling (Vasseur, para. 7 & 45).

**Regarding claim 6**, Soloway suggests moving some or all flows associated with the set of links between switches (para. 40), but fails to explicitly describe that the data flows having MAC addresses.

Vasseur describes: congestion rerouting where data traffic are of Ethernet (i.e. comprising MAC addresses) (para. 45 & 47)).

**Regarding claim 21**, Soloway and Chiu combined describes an informed owner switch reassigns at least one data flow associated with the chosen tag(s) to another, less costly path tag (Soloway, para. 50), but fails to explicitly describe that the data flows have MAC addresses.

Vasseur describes: congestion rerouting where data traffic are of Ethernet (i.e. comprising MAC addresses) (para. 45 & 47)).

***Allowable Subject Matter***

3. **Claim 25** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art fails to further describe tags/labels comprising:

individually, the invalidated tags and the tags associated with the detour comprise a source switch identifier which identifies the originating source switch of the respective packet of the individual tag and a destination switch identifier which identifies the end destination switch of the respective packet of the individual tag.

***Response to Arguments***

4. Applicant's arguments filed January 28, 2009 have been fully considered but they are not persuasive.

On p. 6, para. 5, the applicants argue that the combined prior art fails to describe "selecting a set of paths exiting at the oversubscribed port for retagging". The examiner respectfully disagrees.

The examiner understands that Soloway describes rerouting individual data flows from congested (oversubscribed) links (selected set of paths) to lightly load link (per abstract & para. 20-22) exiting from switch (fig. 1, SW1). Soloway did not describe "retagging", but this limitation is fulfilled by Dantu, where it relabels (retags) packets being routed when traffic is congested (Dantu, col. 21, lines 1-10). Should Soloway

STILL is unconvincing, the secondary prior art also describes: selecting a set of paths exiting at the oversubscribed port for rerouting (fig. 2, a plurality of traffic streams to from edge & to separate intermediate network nodes (paths)). Hence, the examiner believed that the combined references adequately meet the features of "selecting a set of paths exiting at the oversubscribed port for retagging".

On p. 6 last para., the applicants indicate that the last Office Action is inconsistent. The examiner acknowledges the inconsistency and have made minor corrections as indicated above that Soloway describes instead "~~retagging~~ rerouting the received packets.."

On p. 7 para. 1, the applicants similarly repeat the above argument which has been responded above.

On p. 7 para. 4, the applicants similarly repeat the above argument which has been responded above.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Owens (US 7,315,510) describing detection of MPLS network failures, and Ueno (US 2002/0009050) describing a packet transfer method which relieves a processing load.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WARNER WONG whose telephone number is (571) 272-8197. The examiner can normally be reached on 6:30AM - 3:00PM, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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